

Claims:

1. A vertical-axis wind turbine comprising a shaft rotatable about a longitudinal axis and a plurality of substantially rigid blades mechanically coupled to the shaft, each of the plurality of blades comprising an elongate body having an upper end and a lower end, wherein the upper end and the lower end of each blade are rotationally off-set from each other about the longitudinal axis such that each blade has a helix-like form, the section of the elongate body of each blade, taken perpendicularly to the longitudinal axis, being shaped as an aerofoil having a leading edge and a trailing edge and a camber line defined between the leading edge and the trailing edge, characterised in that the aerofoil is arcuately shaped such that the camber line lies along a line of constant curvature having a finite radius of curvature,  $R'$ .
2. A vertical-axis wind turbine as claimed in claim 1 wherein the radial distance  $R$  of the camber line of each blade from the longitudinal axis varies along the length of the blade.
3. A vertical-axis wind turbine as claimed in claim 2 wherein the radius of curvature  $R'$  of the camber line varies along the length of each blade.
4. A vertical-axis wind turbine as claimed in claim 2 or claim 3 wherein  $1.00R \leq R' \leq 1.12R$ .

5. A vertical axis wind turbine as claimed in claim 4 wherein R' is approximately equal to 1.03R.
6. A vertical-axis wind turbine as claimed in claim 4 wherein R' equals R.
7. A vertical-axis wind turbine as claimed in any of claims 2 to 6 wherein the blade shape approximates a troposkein.
8. A vertical-axis wind turbine as claimed in any preceding claim wherein the chord length of each blade varies along the length of the blade.
9. A vertical-axis wind turbine as claimed in claim 8 wherein the chord length of each blade is shorter towards the upper and/or lower ends relative to a central portion of each blade.
10. A vertical-axis wind turbine as claimed in any preceding claim further comprising a plurality of struts mechanically coupling the blades to the shaft.
11. A vertical-axis wind turbine as claimed in claim 10 wherein each blade is joined to the shaft by means of an upper strut and a lower strut.
12. A vertical-axis wind turbine as claimed in claim 11 wherein the elongate body of each blade comprises a central portion extending between the blade's upper and lower struts, an upper portion extending above the blade's

upper strut and a lower portion extending below the blade's lower strut.

13. A vertical-axis wind turbine as claimed in claim 12 wherein the upper portion of each blade defines the upper end, wherein the upper end is free-standing.

14. A vertical-axis wind turbine as claimed in claim 12 or claim 13 wherein the lower portion of each blade defines the lower end, wherein the lower end is free-standing.

15. A vertical-axis wind turbine as claimed in claim 13 or claim 14 wherein the radial distance of the upper end and the lower end of each blade from the longitudinal axis is less than the length of the struts.

16. A vertical-axis wind turbine as claimed in claim 11 wherein the upper strut is joined to the upper end of each blade and the lower strut is joined to the lower end of each blade.

17. A vertical-axis wind turbine as claimed in any of claims 10 to 16 wherein the thickness-to-chord ratio of each blade is greater at or near a junction with the struts compared to the thickness-to-chord ratio of the central portion.

18. A vertical-axis wind turbine as claimed in any preceding claim wherein the thickness-to-chord ratio of each blade increases towards the upper and/or lower ends

of the elongate body compared to the thickness-to-chord ratio of the central portion.

19. A vertical-axis wind turbine as claimed in any of claims 1 to 17 wherein the thickness-to-chord ratio of each blade is constant along the elongate body.
20. A vertical-axis wind turbine as claimed in any preceding claim wherein the turbine comprises three blades equi-spaced about the longitudinal axis.
21. A vertical-axis wind turbine as claimed in any preceding claim further comprising at least one strut between each blade and the rotatable shaft, wherein the strut is formed as a unitary member with the blade.
22. A vertical-axis wind turbine as claimed in any of claims 1 to 9 further comprising at least one disc-like member spanning between each blade and the rotatable shaft.
23. A vertical-axis wind turbine as claimed in claim 22 wherein the at least one disc-like member is located at an extremity of the blades.
24. A vertical-axis wind turbine as claimed in any preceding claim wherein each blade comprises a foam core and a composite skin.
25. A vertical-axis wind turbine comprising a shaft rotatable about a longitudinal axis and a plurality of

substantially rigid blades mechanically coupled to the shaft, each of the plurality of blades comprising an elongate body having an upper end and a lower end, wherein the upper end and the lower end of each blade are rotationally off-set from each other about the longitudinal axis such that each blade has a helix-like form, the section of the elongate body of each blade, taken perpendicularly to the longitudinal axis, being shaped as an aerofoil having a leading edge and a trailing edge and a camber line defined between the leading edge and the trailing edge, characterised in that the length of the camber line of each blade decreases towards the upper and/or lower ends relative to a central portion of each blade.

26. A vertical-axis wind turbine as claimed in claim 25 wherein the length of the camber line of each blade decreases towards at least a downwind end of each blade.